

REMARKS

This paper is responsive to the Office Action mailed from the Patent and Trademark Office on November 29, 2002, which has a shortened statutory period set to expire February 28, 2003.

Drawings

The drawings are objected to on page 3 of the Office Action. In particular, the Examiner writes that "the etch stop layer that is position [sic] between the stress balancing pad and the anchor portion of the metal spring finger must be shown or the feature(s) cancelled from the claim(s)."

The present objection is respectfully traversed because 6(M) (reproduced below for reference) clearly shows a portion 325-A of an etch stop layer formed between anchor portion 122-A of the spring metal finger and stress-balancing pad 130-A.

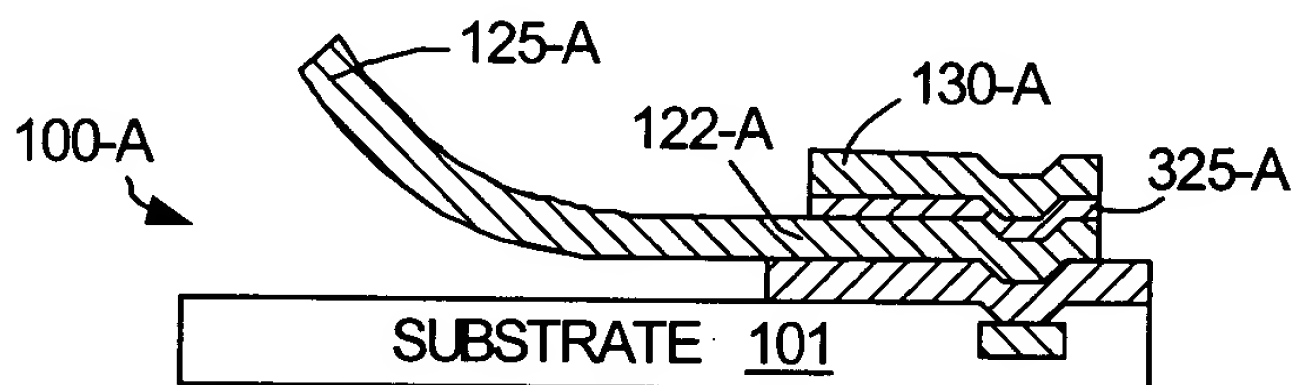


FIG 6(M)

Applicants have amended paragraph 0044 of the specification to clarify that reference number 325-A refers to a portion of etch stop layer 325, which is evident from the discussion spanning paragraphs 0043 through 0046. No new matter is entered by this amendment.

For the above reasons, Applicants respectfully request reconsideration and withdrawal of the objection raised in paragraph 3 of the Office Action.

Claims

Claims 1-19 are pending in the above-identified application. Claims 1-9, 11-15 and 17-19 are rejected for reasons set forth below. Claims 10 and 16 are objected to as being dependent from a rejected base claim, but are otherwise indicated as being allowable. Reconsideration and withdrawal of the pending rejections in view of the following remarks is respectfully requested.

Rejection Under 35 USC 112

Claims 5-7, 13 and 14 are rejected under 35 USC 112, first paragraph. The Examiner writes:

The etch stop layer that is between the stress balancing pad and the anchor portion of the metal finger is not disclosed [sic].

The Examiner is respectfully referred to paragraphs 0043 through 0046 of Applicants' specification (paragraph 0044 is amended herein), which describe a fabrication method including the deposition of an etch stop layer 325, which includes a portion 325-A formed between anchor portion 122-A of the spring metal finger and stress-balancing pad 130-A (see Fig. 6(M), reproduced on page 3 of this Response for reference). Applicants contend these teachings fully support the recitations of Claims 5-7, 13 and 14.

For the above reasons, Applicants respectfully requests reconsideration and withdrawal of the pending rejection under 35 USC 112.

Rejection Under 35 USC 102

Claims 1-9, 11-15, and 17-19 are rejected under 35 USC 102(b) as being anticipated by Fork (USP 6,290,510). Regarding Claim 1, the Examiner writes (in pertinent part):

Referring to claim 1, a spring structure comprising...a stress-balancing pad (Fig. 6 #638-1), formed on the anchor... wherein the stress-balancing pad...has a second internal stress gradient (col. 9 Lines 62-63, where the stress-balancing pad is secured to the substrate and has the opposite stress than the spring metal finger, which the spring metal finger pulls away from the substrate and can be seen in Fig 6), that is opposite to the first internal stress gradient, (Col. 5 Lines 25-34).

Fork teaches a process for fabricating a spring structure in which plated metal 638 is patterned on the spring metal layer to serve as a spring metal/release material mask (i.e., both the spring metal island and the underlying release material pad are self-aligned to the patterned plated metal) (see col. 8, lines 60-67). Fork teaches that plated metal 638 is formed "using a known plating process" (col. 9, lines 30-31), and is then etched to form the portion 638-1 referred to in the Examiner's rejection (col. 9, lines 49-65).

Contrary to the Examiner's contention, Fork does not teach that plated metal portion 638-1 is formed with a "second internal stress gradient" that is "the opposite stress than the spring metal finger". From the above-quoted rejection, the Examiner appears to rely on column 9, lines 62 to 63 and col. 5, lines 25-34 to support his position. The sentence spanning column 9, lines 62 to 63 teaches:

In addition, portions 638-1 of the plated metal are retained on all spring metal that remains secured to the substrate, thereby improving electrical conductance.

The passage spanning column 5, lines 25 to 34 teaches:

Fig. 3(B) shows a spring metal layer 320 formed on release material layer 310 using know processing techniques such that it includes internal stress variations in

the growth direction. For example, in one embodiment, spring metal layer 320 is formed such that its lowermost portions (i.e., adjacent to release material layer 310) has a higher internal tensile stress than an upper portion of spring metal layer 320, thereby causing spring metal layer 320 to have internal stress variations that cause a spring metal finger to bend upward away from substrate 301 (discussed below).

Applicants fail to understand how these passages support for the Examiner's contention that portions 638-1 of the plated metal has a second internal stress gradient that is opposite to the first internal stress gradient of the spring metal finger. Further, Applicants find no other teachings in Fork that support the Examiner's contention. Accordingly, the above-quoted rejection is traversed because Fork fails to teach "a stress-balancing pad formed on the anchor portion of the spring metal finger, wherein the stress-balancing pad has a second internal stress gradient that is opposite to the first internal stress gradient", as recited in Claim 1. Should this rejection be maintained, Applicants respectfully request that the Examiner identify the specific language of Fork that is relied upon to anticipate the "stress-balancing pad" of Claim 1.

Claims 2-9, 12-15, and 17 are dependent from Claim 1, and are distinguished over Fork for at least the reasons provided above with reference to Claim 1.

Claim 18 is rejected for reasons similar to those directed to Claim 1. Similar to Claim 1, Claim 18 recites "wherein the stress-balancing pad is formed from a second stress-engineered material having a second internal moment that opposes to the first internal stress moment". Therefore, Claim 18 is believed

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to be distinguished over Fork for reasons similar to those provided above with reference to Claim 1.

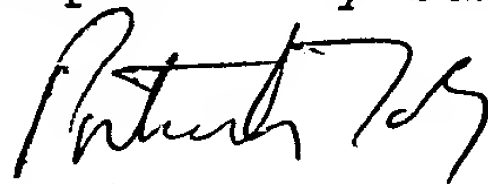
Claim 19 is dependent from Claim 18, and is distinguished over Fork for at least the reasons provided above with reference to Claim 18.

For the above reasons, Applicants respectfully requests reconsideration and withdrawal of the pending rejection under 35 USC 122.

CONCLUSION

Claims 1-19 are pending in the present Application. Reconsideration and allowance of these claims is respectfully requested. Attached is a marked-up version showing the amendments in a document entitled "VERSION WITH MARKINGS TO SHOW CHANGES MADE". If there are any questions, please telephone the undersigned at (408) 451-5902 to expedite prosecution of this case.

Respectfully submitted,



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I hereby certify that this correspondence is being deposited with the United States Postal Service as FIRST CLASS MAIL in an envelope addressed to: BOX NON-FEE AMENDMENT, Assistant Commissioner for Patents, Washington, D.C., 20231, on February 24, 2003.

Feb, 24, 2003 Patrick T. Bever
Date Signature

VERSION WITH MARKINGS TO SHOW CHANGES MADE

SPECIFICATION

[0044] Subsequent processing in accordance with the second method is similar to the first method. A spring metal (first) mask 340 is formed over stress-balancing layer 330 (Fig. 6(E)), and a first etchant (e.g., a Cr etch) 342 is utilized to form spring metal island 320-1, etch stop island 325-1, and stress-balancing island 330-1 (Fig. 6(F)). Subsequently, a second etchant 344 (e.g., anisotropic etching using fluorine plasma) is utilized to etch the release material layer to form a release material island 310-1 (Fig. 6(G)), and the spring metal mask is removed (Fig. 6(H)). A release mask 350 is then formed that exposes a (first) portion 330-1 of the stress-balancing layer (Fig. 6(I)), and then this first portion is removed using etchant 352 (e.g., anisotropic etching using fluorine plasma; Fig. 6(J)). An optional additional etchant 353 is then utilized, if necessary, to remove a portion 325-1A of the etch stop material from claw portion 320-1A (Figs. 6(J) and 6(K)), and then a release etchant 354 is utilized to release claw 125-A (Fig. 6(L)), which then forms a spring structure 100-A (Fig. 6(M)) having essentially the same characteristics described above with reference to Figs. 1-4, wherein a portion 325-A of the etch stop layer is formed between anchor portion 122-A of the spring metal finger and stress-balancing pad 130-A.